The listing of claims will replace all prior versions and listing of claims in the application:

Listing of Claims:

Claims 1-11 (cancelled)

Claim 12 (Original): A method for commutating an electronically commutated multiphase electric motor having a rotor rotatable about a motor axis and a stator assembly configured with stator windings defining phases, comprising the steps of:

(a) providing a sensible system rotatable in correspondence with the rotation of said rotor and having phase commutating information defining sensible transitions at the commencement of each of said phases as they occur in commutational succession;

(b) providing a single sensor operatively associated with said sensible system, having a sensor output altering between sensor states in response to said sensible system transitions ;

(c) identifying a starting phase for energizing said stator windings to cause said rotor to rotate about said motor axis in a given direction;

(d) commencing the operation of said motor by energizing those said stator windings establishng an aligning phase occurring prior to said identified starting phase in said commutational succession to an extent effective to cause said rotor to rotate toward a magnetically stable position exhibiting substantially zero torque;

(e) then de-energizing said stator windings representing said aligning phase and energizing said stator windings representing said starting phase; and

(f) energizing only those said stator windings representing a next phase in said commutational succession in response to said sensor output.

Claim 13 (Original): The method of claim 12 in which:

said step (a) sensible system phase commutating information is provided as magnetic regions of first and second magnetic polarity; and

said step (b) provides said sensor as a Hall effect device.

Claim 14 (Original): The method of claim 13 in which:

said step (a) provides said regions of first and second magnetic polarity in integral form with said rotor regions of alternating polarity.

Claim 15 (Original): The method of claim 13 in which:

said step (a) provides said regions of first and second magnetic polarity as a slave magnet assembly drivably rotatable in correspondence with the rotation of said rotor.

Claim 16 (Original): The method of claim 12 in which:

said step (b) provides said sensor as an optical detector; and

said step (a) sensible system phase commutating information is provided as optically detectable transitions.

Claim 17 (Original): A method for commutating a multiphase electronically commutated electric motor having a rotor rotatable about a motor axis and a stator assembly configured with energizable stator windings, comprising the steps of:

providing a sensible system rotatable in correspondence with the rotation of said rotor and having a reference sensing attribute defining a reference phase and a phase commutating attribute corresponding with the commencement of each phase in a commutation sequence of phases;

providing a sensor having an output with a first attribute in the presence of said sensible system reference sensing attribute and having a second attribute in correspondence with said phase commutating attribute;

mandatorily energizing those said stator windings representing said reference phase in the presence of said output with said first attribute; and

de-energizing those said stator windings representing said reference phase upon the occurrence of said output having said second attribute in the absence of said first attribute and then successively energizing those said stator windings representing subsequent phases in said commutation sequences.

Claim 18 (Original): The method of claim 17 in which:

said step for providing a sensible system provides said reference sensing attribute once within each 360° of electrical rotation of said rotor.

Claim 19 (Original): The method of claim 17 in which:

said step for providing a sensible system provides said reference sensing attribute once within each 360° of rotation of said rotor.

Claim 20 (Original): The method of claim 17 in which:

said step for providing a sensor provides said sensor as a Hall effect device; and

said step for providing a sensible system provides said reference sensing attribute as a magnetic region corresponding with a first rotor rotational extent and of first magnetic polarity.

Claim 21 (Original): The method of claim 17 in which:

said step for providing a sensor provides said sensor as an optical sensor; and said step for providing a sensible system provides said reference sensing attribute as a uniform optical characteristic region corresponding with a first rotor rotational extent.

Claim 22 (Original): The method of claim 21 in which:

said step for providing a sensible system provides said phase commutating attribute as a second region of rotationally shorter uniform optical characteristic with the same optical path property as said first rotor rotational extent.

Claim 23 (Original): The method of claim 20 in which:

said step for providing a sensible system provides said phase commutating attribute as a magnetic region corresponding with a second rotor rotational extent and of said first magnetic polarity.

Claim 24 (Original): The method of claim 23 in which:

said step for providing a sensible system provides said magnetic region corresponding with said first rotor rotational extent as being greater in extent than said second rotor rotational extent.

Claim 25 (Original): The method of claim 17 further comprising the steps of:

identifying a starting phase for energizing said stator winding to cause said rotor to rotate about said motor axis in a select direction;

commencing the operation of said motor by energizing those said stator windings representing an aligning phase occurring prior to said identified starting phase in said commutation sequence of phases for an alignment interval effective to cause said rotor to rotate toward a stable position within said alignment phase exhibiting substantially zero torque wherein said rotor is oriented to derive rotational torque upon energization of said stator windings of said starting phase; and

de-energizing said stator windings representing said aligning phase and energizing said stator windings representing said starting phase.

Claim 26 (Original): The method of claim 25 in which:

said step for identifying a starting phase, identifies said starting phase as said reference phase.

Claim 27 (Original): The method of claim 24 in which:

said step for providing a sensible system provides each said magnetic region in integral relationship with rotor regions of alternating magnetic polarity.

Claims 28-44 (Cancelled)

Claim45 (Original): A control system for the electrical commutation of a multiphase motor having a rotor and a stator assembly comprising:

a sensible system having sensible information transitions which are equal in number to or greater than the number of said motor phases for each 360° of electrical rotation of said rotor;

a single sensor with at least a single output responsive to said transitions to provide sensor output signals; and

a control circuit configured to process said sensor outputs into sequencial motor phase switching command outputs.

Claim46 (Original): The control system of claim 45 in which said single sensor is combined with said control circuit in the form of an integrated circuit.

Claim47 (Original): The control system of claim 45 in which said single sensor comprise a single Hall effect device and said sensible system comprises magnetic regions.

Claim48 (Original): The control system of claim 46 in which said integrated circuit includes power switching devices which control current flow to said electric phases of said motor.

Claim 49 (Original): The control system of claim 45 in which said control circuit controls at least three discreet power switching devices that effect current flow in said electrical phases of said motor.

Claim 50 (Original): The control system of claim 45 in which said sensor and said control circuit are combined within the confines of said motor.

Claim 51 (Original): The control system of claim 45 in which:

said motor is configured for three-phase operation; and

said sensible system contains six said sensible information transitions in 360° of electrical rotation of said rotor.

Claim 52 (Original): The control system of claim 45 in which:

said sensible system is configured with six sensible information transitions in 360° of electrical rotation of said rotor; and

said control circuit is configured with six outputs to effect energization of said multiphase motor in a three phase bipolar form.

Claim 53 (Original): The control system of claim 45 in which:

said motor is configured for four-phase unipolar operation; and

said sensible system contains four said sensible information transitions in 360° of electrical rotation of said rotor.

Claim 54 (Original): The control system of claim 45 in which:

said motor is configured for two-phase bipolar operation; and

said sensible system contains four said sensible information transitions in 360° of electrical rotation of said rotor.

Claim 55 (Original): The control system of claim 45 in which:

said single sensor is an optical device; and

said sensible system transitions comprise optically detectable transitions.

Claim56 (Original): The control system of claim 45 in which said sensible information transitions comprise alternating areas of magnetic field polarity.

Claim 57 (Original): The control system of claim 45 in which:

said sensible system sensible information transitions are comprised of the presence of a magnetic field polarity and the substantial non-presence thereof.

Claim 58 (Original): The control system of claim 45 in which:

said sensible system sensible comprises magnetic regions of two polarities and one of said polarities contains flux intensities of two different levels occurring in 360° of electrical rotation of said rotor.

Claim 59 (Original): The control system of claim 47 in which:

said single sensor is configured to provide two or more said output signals, each said output signal being derived at a unique magnetic sensitivity level.

Claim 60 (Original): The control system of claim 59 in which:

said Hall effect device is configured with a single Hall plate in an assembly deriving two or more levels of sensitivity to magnetic field intensities encountered at said sensible system, each said level differing from any other such level by at least about 50 Gauss.

Claim 61 (Original): The control system of claim 59 in which:

said Hall effect device is configured with two or more Hall plates on a monolithic substrate.

Claim 62 (Original): The control system of claim 59 in which:

said single sensor is comprised of two or more Hall effect circuits positioned in a single integrated circuit package.

Claim 63 (Original): A motor commutational control circuit for use with a sensible system having three unique magnetic level regions in 360° of electrical rotation of the rotor of said motor and rotatable in correspondence with the rotation of said rotor to provide multiphase motor performance, said circuit comprising:

a Hall effect sensor based network in a single location responsive to said magnetic level regions to provide information to motor control logic circuitry to effect energization of a predetermined motor phase associated with each of said three unique magnetic level regions, said Hall effect sensor based network being located in a single semiconductor package.

Claim 64 (Original): A motor commutational control circuit for use with a sensible system having four unique magnetic level regions in 360° of electrical rotation of the rotor of said motor and rotatable in correspondence with the rotation of said rotor to provide four-phase unipolar or two phase bipolar motor performance said circuit comprising:

a Hall effect sensor based network in a single location responsive to said magnetic level regions to provide information to motor control logic circuitry to effect energization of a predetermined motor phase associated with each of said four unique magnetic level regions, said Hall effect sensor based network being located in a single semiconductor package.

Claim 65 (Original): A Hall effect sensor based motor control circuit, comprising:

a sensing network including a Hall effect device with one or more Hall plates responsive to flux intensity of given levels and polar sense of an encountered magnetic field to provide Hall plate output or outputs corresponding with said flux intensity and polar sense;

an amplification and level detecting network responsive to said Hall plate output or outputs and deriving therefrom two or more differing sensitivity, level detecting network outputs, each said network outputs differing in sensitivity level by about 50 or more Gauss; and

control circuit with logic responsive to said network outputs to provide motor drive output signals for multiphase motor operation.

Claim 66 (Original): The Hall effect sensor based motor control circuit of claim 65 in which:

said amplification and level detecting network sensitivity levels comprise first operate and release levels responsive in the presence of a first said polar sense and a first said flux intensity to provide a first said network output; and

second operate and release levels at least one of which is responsive in the presence of a second said polar sense and a second said flux intensity to provide a second said network output.

Claims 67-108

Claim 109 (Original): A control system for an electronically commutated three phase unipolar driven electric motor having a permanent magnet rotor rotatable about a motor axis and a stator assembly configured with stator windings arranged for three phase unipolar operation comprising:

a permanent magnet based sensible system rotatable in correspondence with the rotation of said rotor and having phase commutating information defined by three distinct sensible regions in 360° of electrical rotation;

at least a single magnetic sensing sensor circuit located in a single position with first and second outputs each responsive to different flux levels from said sensible system to

define a succession of three distinct combined logic states when under the operational influence of said sensible system; and

a control circuit coupled with said single sensor circuit said first and second outputs to effect an operational sequencing drive to three outputs providing said three phase unipolar driven electric motor operation.

Claim 110 (Original): The sensor circuit and control circuit of claim 109 which are integrated on a monolithic silicon die.

Claim 111 (Original): The control system of claim 109 in which:

said sensible system is formed as an integral part of said permanent magnet rotor.

Claim 112 (Original): The control system of claim 111 in which:

said permanent magnet rotor is radially magnetized and said sensible system with said three distinct sensible regions are each of approximately 120° in electrical length and two of said regions are comprised of the permanent magnet material as radially magnetized and the third region is composed of an absence of said permanent magnet material on an axial end edge of said radially magnetized said permanent magnet.

Claim 113 (Original): The control system of claim 112 in which:

said sensor is located adjacent to said axial end edge of said permanent magnet and is set to detect the axial flux field or lack of field present at said axial end edge comprising said sensible system.

Claim 114 (Original): The control system of claim 109 in which:

said sensor said first and second outputs combine to create three distinct digital codes when under the operational influence of said sensible system said three distinct sensible regions in 360° of electrical rotation; and

said three distinct digital codes combine with said control circuit to effect said operational sequencing drive.

Claim 115 (Original): The control system of claim 109 in which:

said permanent magnet based sensible system is formed of a permanent magnet separate from said permanent magnet rotor and provides said three distinct sensible regions as read by said sensor as a region of magnetic field intensity of one polar sense, a region of no

significant magnetic field intensity and a region of magnetic field intensity of a second polar sense.

Claim 116 (Original): The control system of claim 109 in which:

said permanent magnet based sensible system is formed of a permanent magnet separate from said permanent magnet rotor which provides said three distinct regions as read by said sensor as a first region of magnetic field intensity of one polar sense, a second region of the same polar sense but of lesser field magnitude by about 1/2 to 1/3 of said first region and a third region of magnetic field intensity of a second polar sense.

Claim 117 (Original): The motor commutational control circuit of claim 63, in which:

said Hall effect sensor based network and said motor control logic circuitry are combined in a monolithic integrated circuit.

Claim 118 (Original): The motor commutational control circuit of claim 63, in which:

said Hall effect sensor based network contains two outputs each responsive to a different magnetic polarity.